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PATENT
Attorney's Matter No. P0487

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Art Unit: 2624
Conf. No.: 3362

McKinley et al.
Application No.: 10/053,488

Filed: November 2, 2001

For: PARALLEL PROCESSING OF DIGITAL WATERMARKING OPERATIONS

VIA ELECTRONIC FILING

Examiner: W. Chen

Date: February 27, 2009

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

This response is in furtherance of the Notice of Non-Compliant Appeal brief mailed December 30, 2008. Please charge any fee required to deposit account 50-1071.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 4, 18-19, 23-24 and 26-28 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,960,081 by Vynne et al. ("Vynne").

Claims 4, 18-19, 23-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne.

Claims 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne in view of U.S. Patent No. 6,389,421 to Hawkins et al. ("Hawkins").

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,611,830 to Shinoda in view of Vynne.

VII. ARGUMENT

Claims 4, 18-19 and 23-24, 26-28 are not anticipated by Vynne

Claim 4

Vynne does not disclose, teach or suggest: "sub-dividing the media signal into segments based on analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal;" in combination with the other elements of claim 1. Vynne teaches a method and system to protect video materials by modifying motion information with a digital signature. Col. 2, lines 13-15. The motion information corresponds to motion vectors that are computed using a block-based video compression scheme, specifically, the MPEG-2 video compression standard. Col. 2, lines 16-22. In the MPEG-2 video compression standard, motion vectors are computed per block. Vynne's technique of modifying motion vectors is applied after the video is in block format as a result of these MPEG compression operations. Col. 4, lines 29-33. Vynne adjusts the motion vector of a block to embed part of a signature, and the motion vector for the block is previously computed as part of the MPEG coding process. Therefore, Vynne's method has no ability to modify or adapt the manner of sub-dividing the video into blocks according to an analysis of the media signal as

claimed because the MPEG coding process fixes the manner of sub-dividing the video into blocks and any change to the manner in which the media signal is subdivided would conflict with this fixed video compression standard.

As such, Vynne's method teaches away from the claimed method, which includes: "sub-dividing the media signal into segments based on analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal;" in combination with other elements. In Vynne, the video is divided into blocks for the block based compression scheme, and therefore, the process of dividing the video into blocks has nothing to do with an "analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal" as claimed.

Claim 4 further recites: "analyzing the media signal to prioritize the segments of the media signal for digital watermark operations on the segments wherein the media signal segments are prioritized for digital watermark embedding operations and wherein the media signal segments are prioritized such that segments that are more likely to carry a readable watermark signal are given higher priority for the embedding operations; distributing the prioritized segments to parallel processors; and performing parallel digital watermark operations on the prioritized segments in the parallel processors according to priority order of the prioritized segments. [emphasis added]"

The Office's contends that Vynne's teaching of selecting a subset of suitable blocks for coding of a signature in the motion vectors of those blocks corresponds to the claimed process. There are at least two significant errors in the Office's contention. First, merely selecting a subset of suitable blocks for motion vector coding does not suggest that the suitable blocks are prioritized for digital watermark embedding operations as claimed. Second, Vynne performs this selection of suitable blocks after all of the blocks are distributed to processors, and as such, Vynne does not distribute "the prioritized segments to parallel processors" as claimed.

Claim 4 positively recites "performing parallel digital watermark operations on the prioritized segments in the parallel processors according to a priority order of the prioritized segments." Vynne's non-suitable blocks are explicitly not selected nor operated upon as claimed, and as such, can not be deemed to correspond to prioritized segments of claim 4.

Regarding the selected blocks, Vynne does not process the selected blocks "according to a priority order." Therefore, Vynne's mere selection of suitable blocks does not correspond to the claim language for which it is cited.

Moreover, claim 4 further recites that it is the prioritized segments that are distributed to the parallel processors. Vynne does not teach prioritizing the segments before distributing them to the parallel processors. In fact, Vynne's technique requires that the blocks be distributed to parallel processors before any subset of blocks is selected for coding. As described in the cited passage at col. 27, lines 6-19, Vynne distributes all of the blocks in the image to the processors. In equation 7.1, the numerator is m_b, the number of blocks in the image, and the denominator is NPES, the number of processors. Thus, all of the blocks in the image are distributed to the processors prior to any selection of blocks for coding. This approach, of course, defeats the purpose of prioritization because distributing all blocks requires processing resources to be consumed in distributing blocks to the parallel processors that do not get selected for coding.

For at least the above reasons, Vynne does not disclose nor even suggest all of the elements of claim 4.

Claim 18

Regarding claim 18, Vynne fails to disclose, teach or suggest: "performing parallel digital watermark operations on the segments in the parallel processors wherein the media signal is segmented based on probability of watermark detection and prioritized for parallel watermark decoding operations based on probability of watermark detection" in combination with the other elements of claim 18. As noted above, the video in Vynne is in a block format as a result of MPEG compression coding. See also, col. 27, lines 41-43, indicating that Vynne's method requires converting the video to block based MPEG-2 compressed format prior to any processing of the motion vectors to embed a signature. Because the MPEG-2 video compression standard sets forth a fixed method for subdividing the video into fixed blocks in Vynne, this MPEG video is not segmented based on probability of watermark detection and prioritized for parallel watermark decoding operations based on probability. Instead, the video is divided into blocks for the purpose of video compression before any processing is performed on the video to decode an

embedded signature. Vynne clearly fails to teach, and even teaches away from "the media signal is segmented based on probability of watermark detection" as claimed in combination with the other elements of claim 18.

Dependent claim 19 is patentable for at least the reasons provided for claim 18.

Claim 23

The Office wrongly contends that Vynne's thresholds at col. 22, lines 1-9, correspond to the claimed perceptual mask. These thresholds in Vynne are used for selecting blocks having a certain criteria for coding, not for controlling the embedding in those blocks. Vynne's thresholds are not dependent on and automatically computed from the content of the media signal as recited in claim 23 in combination with the other elements. Instead, Vynne teaches that the thresholds are derived manually and a common set of thresholds for selecting blocks is derived that is used for selecting blocks in all frames of a particular video as well as in different videos. See, for example, col. 28, lines 40-44, which states that a common set of thresholds is manually derived that applies to all four test videos. As such, the thresholds are clearly not dependent on and computed automatically from that content of the media signal as claimed. Since the same thresholds are used for different video in a manner that is not dependent on the particular video, and further, the thresholds are manully set by the user, they teach away from the claimed perceptual mask recited in claim 23.

It is acknowledged that Vynne's thresholds are manually adjustable by a user using DirectView as described at the bottom of col. 27 to col. 28. These adjustments are made manually based on the user's subjective analysis of the video. Vynne's thresholds are clearly not automatically computed from the content of the media signal, but instead manually set by the user as a result of a subjective analysis of the video. Further, this manual adjustment is merely used to set a fixed set of thresholds that is applied to different videos as described at col. 28, lines 40-44.

Claim 23 further recites: "the perceptual mask specifying areas of the media signal and is used to control embedding of the watermark in the areas." Vynne's thresholds do not specify areas of the watermark signal as claimed. In contrast, Vynne applies the same threshold irrespective of the area in which the watermark is embedded. Vynne's thresholds are

independent from any area or block of the video. Therefore, the thresholds cannot possibly specify areas of the media signal and be used to control embedding of the watermark in the areas as claimed.

For these reasons, Vynne does not anticipate claim 23. Moreover, claims 24 and 26-28 are patentable for at least the same reasons.

Claims 4, 18-19 and 23-24, 26-28 are not obvious in view of Vynne

The Notice of Non-Compliant Appeal brief of December 30 2008, objects to the combination of the arguments applied to the anticipation and obviousness rejections of claims 4, 18-19 and 23-24, 26-28 over Vynne under a single heading. This Notice indicated that the Office read the teachings of Vynne differently for the different grounds of rejection that relied on Vynne. Since the Applicant considered the Office's interpretations for the obviousness rejection in the previous section, the same arguments apply to the obviousness rejection over Vynne. Thus, the arguments from the previous section are repeated here to comply with the formal request of the Office to have separate sections for these grounds of rejection, but for the convenience of the reader, the arguments are the same.

Claim 4

Vynne does not disclose, teach or suggest: "sub-dividing the media signal into segments based on analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal;" in combination with the other elements of claim 1. Vynne teaches a method and system to protect video materials by modifying motion information with a digital signature. Col. 2, lines 13-15. The motion information corresponds to motion vectors that are computed using a block-based video compression scheme, specifically, the MPEG-2 video compression standard. Col. 2, lines 16-22. In the MPEG-2 video compression standard, motion vectors are computed per block. Vynne's technique of modifying motion vectors is applied after the video is in block format as a result of these MPEG compression operations. Col. 4, lines 29-33. Vynne adjusts the motion vector of a block to embed part of a signature, and the motion vector for the block is previously computed as part of the MPEG coding process. Therefore, Vynne's method has no ability to modify or adapt the manner of sub-dividing the video into blocks according to an analysis of the media signal as

claimed because the MPEG coding process fixes the manner of sub-dividing the video into blocks and any change to the manner in which the media signal is subdivided would conflict with this fixed video compression standard.

As such, Vynne's method teaches away from the claimed method, which includes: "sub-dividing the media signal into segments based on analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal;" in combination with other elements. In Vynne, the video is divided into blocks for the block based compression scheme, and therefore, the process of dividing the video into blocks has nothing to do with an "analysis of the media signal to identify parts of media signal having signal characteristics that are more likely to carry a readable watermark signal" as claimed.

Claim 4 further recites: "<u>analyzing the media signal to prioritize the segments</u> of the media signal for digital watermark operations on the segments wherein the media signal segments are prioritized for digital watermark embedding operations and wherein the media signal segments are prioritized such that segments that are more likely to carry a readable watermark signal are given higher priority for the embedding operations; distributing <u>the prioritized segments</u> to parallel processors; and performing parallel digital watermark operations on the prioritized segments in the parallel processors <u>according to priority order of the prioritized segments</u>. [emphasis added]"

The Office's contends that Vynne's teaching of selecting a subset of suitable blocks for coding of a signature in the motion vectors of those blocks corresponds to the claimed process. There are at least two significant errors in the Office's contention. First, merely selecting a subset of suitable blocks for motion vector coding does not suggest that the suitable blocks are prioritized for digital watermark embedding operations as claimed. Second, Vynne performs this selection of suitable blocks after all of the blocks are distributed to processors, and as such, Vynne does not distribute "the prioritized segments to parallel processors" as claimed.

Claim 4 positively recites "performing parallel digital watermark operations on the prioritized segments in the parallel processors according to a priority order of the prioritized segments." Vynne's non-suitable blocks are explicitly not selected nor operated upon as claimed, and as such, can not be deemed to correspond to prioritized segments of claim 4.

Regarding the selected blocks, Vynne does not process the selected blocks "according to a priority order." Therefore, Vynne's mere selection of suitable blocks does not correspond to the claim language for which it is cited.

Moreover, claim 4 further recites that it is the prioritized segments that are distributed to the parallel processors. Vynne does not teach prioritizing the segments before distributing them to the parallel processors. In fact, Vynne's technique requires that the blocks be distributed to parallel processors before any subset of blocks is selected for coding. As described in the cited passage at col. 27, lines 6-19, Vynne distributes all of the blocks in the image to the processors. In equation 7.1, the numerator is m_b, the number of blocks in the image, and the denominator is NPES, the number of processors. Thus, all of the blocks in the image are distributed to the processors prior to any selection of blocks for coding. This approach, of course, defeats the purpose of prioritization because distributing all blocks requires processing resources to be consumed in distributing blocks to the parallel processors that do not get selected for coding.

For at least the above reasons, Vynne does not disclose nor even suggest all of the elements of claim 4.

Claim 18

Regarding claim 18, Vynne fails to disclose, teach or suggest: "performing parallel digital watermark operations on the segments in the parallel processors wherein the media signal is segmented based on probability of watermark detection and prioritized for parallel watermark decoding operations based on probability of watermark detection" in combination with the other elements of claim 18. As noted above, the video in Vynne is in a block format as a result of MPEG compression coding. See also, col. 27, lines 41-43, indicating that Vynne's method requires converting the video to block based MPEG-2 compressed format prior to any processing of the motion vectors to embed a signature. Because the MPEG-2 video compression standard sets forth a fixed method for subdividing the video into fixed blocks in Vynne, this MPEG video is not segmented based on probability of watermark detection and prioritized for parallel watermark decoding operations based on probability. Instead, the video is divided into blocks for the purpose of video compression before any processing is performed on the video to decode an

embedded signature. Vynne clearly fails to teach, and even teaches away from "the media signal is segmented based on probability of watermark detection" as claimed in combination with the other elements of claim 18.

Dependent claim 19 is patentable for at least the reasons provided for claim 18.

Claim 23

The Office wrongly contends that Vynne's thresholds at col. 22, lines 1-9, correspond to the claimed perceptual mask. These thresholds in Vynne are used for selecting blocks having a certain criteria for coding, not for controlling the embedding in those blocks. Vynne's thresholds are not dependent on and automatically computed from the content of the media signal as recited in claim 23 in combination with the other elements. Instead, Vynne teaches that the thresholds are derived manually and a common set of thresholds for selecting blocks is derived that is used for selecting blocks in all frames of a particular video as well as in different videos. See, for example, col. 28, lines 40-44, which states that a common set of thresholds is manually derived that applies to all four test videos. As such, the thresholds are clearly not dependent on and computed automatically from that content of the media signal as claimed. Since the same thresholds are used for different video in a manner that is not dependent on the particular video, and further, the thresholds are manully set by the user, they teach away from the claimed perceptual mask recited in claim 23.

It is acknowledged that Vynne's thresholds are manually adjustable by a user using DirectView as described at the bottom of col. 27 to col. 28. These adjustments are made manually based on the user's subjective analysis of the video. Vynne's thresholds are clearly not automatically computed from the content of the media signal, but instead manually set by the user as a result of a subjective analysis of the video. Further, this manual adjustment is merely used to set a fixed set of thresholds that is applied to different videos as described at col. 28, lines 40-44.

Claim 23 further recites: "the perceptual mask specifying areas of the media signal and is used to control embedding of the watermark in the areas." Vynne's thresholds do not specify areas of the watermark signal as claimed. In contrast, Vynne applies the same threshold irrespective of the area in which the watermark is embedded. Vynne's thresholds are

independent from any area or block of the video. Therefore, the thresholds cannot possibly specify areas of the media signal and be used to control embedding of the watermark in the areas as claimed.

For these reasons, Vynne does not anticipate not render obvious claim 23. Moreover, claims 24 and 26-28 are patentable for at least the same reasons.

Clam 2 is not obvious in view of Vynne

Claim 2

Vynne does not distribute "the specified parts to parallel processors after the specifying the locations of the parts to be embedded with corresponding digital watermark messages" as recited in claim 2 in combination with the other claim elements. As described in the cited passage at col. 27, lines 6-19, Vynne distributes all of the blocks in the image to the processors. In equation 7.1, the numerator is m_b, the number of blocks in the image, and the denominator is NPES, the number of processors. It is not the suitable blocks that are divided among the processors, but instead, all of the blocks in the image. Only after distributing all of the blocks to the processors, each processor selects "suitable" blocks for coding of a signature or not.

Vynne, therefore, does not disclose or suggest all of the elements of claim 2. In fact, Vynne teaches away from claim 2 because it teaches distributing all blocks of an image to processors and then selecting "suitable" blocks for modification of the motion vectors after all of the blocks have been distributed. This is a different and inefficient approach because it requires that resources be consumed to distribute all of the blocks, including blocks that are later deemed to be unsuitable for further processing.

Claim 2 is patentable over Vynne and Hawkins

Regarding claim 2, the combined teachings of Vynne and Hawkins do not suggest: "distributing the specified parts to parallel processors after the specifying of the locations of the parts to be embedded with corresponding digital watermark messages" in combination with the other elements of claim 2.

The Office contends that "A task associated with points is a block of signal." In

Hawkins, "points" are a unit for a processing resource to be assigned to a processing task. There is no suggestion of associating such units of processing resources to a block of a signal. Therefore, Hawkins does not teach the elements of claim 2 that are missing from Vynne. As such, the combination of the two references fail to disclose or teach all of the elements of claim 2.

Claim 34 is patentable over the combination of Shinoda and Vynne

Claim 34 is patentable over Shinoda in view of Vynne. Shinoda only teaches embedding one image at a time. Therefore, it does not teach any of the elements of claim 34 relating to batch processing, such as "the requests including a list of media signal files and information to be linked with the media signal files," and "a batch registration extractor for reading the registration database and creating an embedder control file, including identifiers, a corresponding list of media signal files, and embedding instructions for controlling embedding of the identifiers in the media signal files" [emphasis on elements dealing with batch embedding on a list of media signal files added]. Vynne does not teach any of these elements either, therefore, the combination fails to teach all of the elements of claim 34.

Respectfully submitted,

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